

# BIPOLAR TRANSISTOR WITH ISOLATION AND DIRECT CONTACTS

## Abstract

A bipolar transistor has a collector that is contacted directly beneath a base-collector junction by metallization to reduce collector resistance. A conventional reach-through and buried layer, as well as their associated resistance, are eliminated. The transistor is well isolated, nearly eliminating well-to-substrate capacitance and device-to-device leakage current. The structure provides for improved electrical performance, including improved  $f_T$ ,  $F_{max}$  and drive current.